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More Multiplication Properties of Exponents

Unit 7 Lesson 3

MORE MULTIPLICATION PROPERTIES OF EXPONENTS

Students will be able to:

Simplify polynomials using the multiplication law of exponent.

Key Vocabulary:

- Positive Exponent
- Properties of Power
- Base



MORE MULTIPLICATION PROPERTIES OF EXPONENTS

More Multiplication Properties of Exponent

Power of a Power

$$\left(a^m\right)^n = a^{mn}$$

Power of a Product

$$(ab)^m = a^m b^m$$



MORE MULTIPLICATION PROPERTIES OF EXPONENTS

Sample Problem 1: Simplify the following expressions.

1. $(x^2)^3$

2. $(2^2)^3$

3. $(ab)^3$

4. $(2x)^2$



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Sample Problem 1: Simplify the following expressions.

$$1. (x^2)^3 = x^6$$

$$2. (2^2)^3 = 2^6 = 64$$

$$3. (ab)^3 = a^3 b^3$$

$$4. (2x)^2 = 2^2 x^2 = 4x^2$$



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Sample Problem 2: Evaluate the following using properties of powers.

$$5.ab^3(a^2b)^4$$

$$6.(3x)(2x)^2$$

$$7.-4^2(ab^2c^3)^3$$

$$8.(4v^3)^2(2v^3)^3$$

$$9.2x^3y^2(3x^{-2}y^{-1})^3$$

$$10.\left(\frac{2x}{y}\right)^3(3x)^2$$

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Sample Problem 2: Evaluate the following using properties of powers.

$$\begin{aligned} 5. ab^3(a^2b)^4 &= ab^3(a^8b^4) \\ &= a^9b^7 \end{aligned}$$

$$\begin{aligned} 6. (3x)(2x)^2 &= (3x)4x^2 \\ &= 12x^3 \end{aligned}$$

$$7. -4^2(ab^2c^3)^3 = -16a^3b^6c^9$$

$$\begin{aligned} 8. (4v^3)^2(2v^3)^3 &= 16v^6(8v^9) \\ &= 128v^{15} \end{aligned}$$

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Sample Problem 2: Evaluate the following using properties of powers.

$$\begin{aligned} 9. & 2x^3y^2(3x^{-2}y^{-1})^3 \\ &= 2x^3y^2(27x^{-6}y^{-3}) \\ &= 54x^{-3}y^{-1} \\ &= \frac{54}{x^3y} \end{aligned}$$

$$\begin{aligned} 10. & \left(\frac{2x}{y}\right)^3(3x)^2 \\ &= \frac{8x^3}{y^3}(9x^2) \\ &= \frac{72x^5}{y^3} \end{aligned}$$